

INTERNATIONAL SEARCH REPORT

National Application No
PCT/US2005/000755

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04N7/50 H04N7/26

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	ZHENG GUO LI, WEN GAO, FEG PAN, SIWEI MA, KENG PANG LIM, GENAN FENG, XIAO LIN, SUSANTO RAHARDJA, HANQIN LI, YAN LU: "adaptive control with HRD consideration" ISO/IEC JTC1/SC29/WG11 & ITU-T SG16 Q.6--JVT-H014, 26 May 2003 (2003-05-26), pages 1-18, XP002328786 GENEVA page 1	1-4, 17-20
A	-----	5,21

☐ Further documents are listed in the continuation of box C.

☐ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
 "E" earlier document but published on or after the international filing date
 "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
 "O" document referring to an oral disclosure, use, exhibition or other means
 "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
 "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
 "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
 "&" document member of the same patent family

Date of the actual completion of the international search

6 July 2005

Date of mailing of the international search report

04.11.05

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax: (+31-70) 340-3016

Authorized officer

Raeymaekers, P

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2005/000755

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-5, 17-21

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-5,17-21

video encoder and method with more detail for intracoded than for intercoded frames

1.1. claims: 3-5,19-21

video encoder and method with calculation of macroblock QP's based on picture type

2. claims: 6-10,22-26

video encoder and method with intra prediction means for a subset of allowable intra prediction modes

3. claims: 11,13,27,29

video encoder and method with bit allocation allocating more targets bits for pictures at the beginning of the GOP than for subsequent pictures in the GOP

4. claims: 12,14,15,28,30,31

video encoder and method for limiting the number of bits transferred from one GOP to the next

5. claims: 16,32

video encoder and method for virtual frame skipping

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/US2005/000755

International filing date (day/month/year)
11.01.2005

Priority date (day/month/year)
30.01.2004

International Patent Classification (IPC) or both national classification and IPC
H04N7/50, H04N7/26

Applicant
THOMSON LICENSING S.A.

Event	<i>First Opinion</i>
Deadline	<i>04 Feb. '06</i>
Entered	<i>18 Jan. '05</i>

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office - Gitschiner Str. 103
D-10958 Berlin
Tel. +49 30 25901 - 0
Fax: +49 30 25901 - 840

Authorized Officer

Raeymaekers, P

Telephone No. +49 30 25901-443



**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2005/000755

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material:
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing:
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2005/000755

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 1-5,17-21,33

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for the whole application or for said claims Nos. 6-16,22-32

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form

☐ has not been furnished

☐ does not comply with the standard

the computer readable form

☐ has not been furnished

☐ does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-bis of the Administrative Instructions.

☐ See separate sheet for further details

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2005/000755

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has:
- ☐ paid additional fees.
 - ☐ paid additional fees under protest.
 - ☒ not paid additional fees.
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
 - ☒ not complied with for the following reasons:
see separate sheet
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☐ all parts.
 - ☒ the parts relating to claims Nos. 1-5,17-21,33

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	5,21
	No: Claims	1-4,17-20,33
Inventive step (IS)	Yes: Claims	5,21
	No: Claims	1-4,17-20,33
Industrial applicability (IA)	Yes: Claims	1-5,17-20,33
	No: Claims	

2. Citations and explanations

see separate sheet

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

PCT/US2005/000755

Re Item IV.

The separate inventions/groups of inventions are:

1. Claims 1-5,17-21,33
video encoder and method with more detail for intracoded than for intercoded frames
Note: claim 33 was not mentioned in the search report by mistake. This is corrected in the written opinion by adding claim 33 to the first group of inventions.
2. Claims 6-10,22-26
video encoder and method with intra prediction means for a subset of allowable intra prediction modes
3. Claims 11,13,27,29
video encoder and method with bit allocation allocating more targets bits for pictures at the beginning of the GOP than for subsequent pictures in the GOP
remark : from the description follows that claims 13 and 29 depend on claims 11 and 27 respectively, and not on 12 and 28 as shown by the claims structure. Therefore claims 13 and 29 were attributed to the claims 11 and 27.
4. Claims 12,14,15, 28, 30, 31
video encoder and method for limiting the number of bits transferred from one GOP to the next
5. Claims 16,32
video encoder and method for virtual frame skipping

They are not so linked as to form a single general inventive concept (Rule 13.1 PCT) for the following reasons:

The cited document xp2328786 discloses claim 1 :

"means for generating a QP estimate" : p.1 of cited document, "a quantization parameter should be first determined for each MB" in combination with "...used to predict the MAD of current basic unit by that of the basic unit in the co-located position of the previous frame."
"means for selection of a frame level QP..using one of mean of QP estimates for the macroblocks" : p. 13 : "Qapf is the average value...for all basic unit in the previous frame" in combination with p. 14, "Step 6 :Qapf is updated"

Therefore the special technical features (STF's) of the inventions are the features of claim 2, 5, 6, 11, 12 and 16. These features are different apart from the bit allocation means which is common to claims 11, 12 and 16. The bit allocation means (and the GOP structure) are however disclosed on p. 5.

The problems solved by these features are :

1. Claim 5 (claim 3 is disclosed by p. 13, case 3, claim 4 on p. 11, par. 5, "Same as the frame layer control ...for each P frame.") : How to improve image detail ?
2. Claim 6 : How to reduce calculation complexity ?
3. Claim 11 : How to distribute bits within a GOP more efficiently ?
4. Claim 12 : How to arrange the transfer of bits between GOPs efficiently ?
5. Claim 16 : How to prevent buffer overflow ?

Since the STF's are not identical and not corresponding (the underlying problems are not identical), the inventions are not connected by an inventive concept. Therefore, they are non-unitary.

Re Item V.

1. Reference is made to the following document:
D1 : ZHENG GUO LI, WEN GAO, FENG PAN, SIWEI MA, KENG PANG LIM, GENAN FENG, XIAO LIN, SUSANTO RAHARDJA, HANQIN LI, YAN LU: "adaptive control with HRD consideration" ISO/IEC JTC1/SC29/WG11 & ITU-T SG16 Q.6--JVT-H014, 26 May 2003 (2003-05-26), pages 1-18, XP002328786 GENEVA
2. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1-4, 17-20, 33 is not new in the sense of Article 33(2) PCT. Document D1 discloses (the references in parentheses applying to this document):

Claims 1,17 and 33:

"a video encoder...divisible into macroblocks"(D1 concerns video encoding)

"means for generating a QP estimate...image frame"(p.1 of cited document, "a quantization parameter should be first determined for each MB" in combination with "...used to predict the MAD of current basic unit by that of the basic unit in the co-located position of the previous frame.")

"means for selection of a frame level QP..using one of mean of QP estimates for the macroblocks" (p. 13 : "Qapf is the average value...for all basic unit in the previous frame" in combination with p. 14, "Step 6 :Qapf is updated")

Claims 2 and 18 : the rate control of D1 is in the framework of H.264 (p.2, last par.).

Claims 3 and 19: (p.13, case 3)

Claims 4 and 20: (p. 11, par. 5, "Same as the frame layer control ...for each P frame.").
Different calculations in D1 are made according to picture type.

3. The application does not meet the requirements of Article 6 PCT, because claims 5 and 21 are not supported by the description.

On p. 13 of the application, formulas for α (alpha) are given for P and I pictures. From these formulas follow that α for the P-pictures can be higher as well as lower as the α for the I picture depending on the parameters used in the formulas. Therefore, no support can be found for the maintenance of more detail in intracoded pictures in comparison to intercoded pictures.

From the INTERNATIONAL BUREAU

PCTCOMMUNICATION IN CASES FOR WHICH
NO OTHER FORM IS APPLICABLE

To:

TRIPOLI, Joseph, S.
c/o Thomson Licensing Inc.
2 Independence Way
Suite 2
Princeton, NJ 08540
ETATS-UNIS D'AMERIQUE

Date of mailing (day/month/year)

24 October 2005 (24.10.2005)

Applicant's or agent's file reference

pu040035

REPLY DUE

see paragraph 1 below

International application No.

PCT/US2005/000755

International filing date (day/month/year)

11 January 2005 (11.01.2005)

Applicant

THOMSON LICENSING S.A. et al

1. ☐ REPLY DUE within months/days from the above date of mailing
☐ NO REPLY DUE, however, see below
☒ IMPORTANT COMMUNICATION
☐ INFORMATION ONLY

2. COMMUNICATION:

"The International Bureau hereby informs the applicant that due to a technical error which occurred during the processing of the international application at the International Bureau, the designation of San Marino (SM), which was made in the international application, was not published in this international application.

The Patent and Trademark Office (San Marino) has been notified that San Marino was designated in this international application.

We draw your attention to the fact that the International Bureau does not plan to republish the international application in order to include an indication of the designation of San Marino (SM). However, if the applicant intends to enter the national phase in that State, the International Bureau would agree to republish the international application upon a specific request of the applicant.

We apologize for the inconvenience this error may have caused."

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Authorized officer

Carlos Roy - Gijsbertus Beijer

Facsimile No. +41 22 740 14 35

Telephone No. +41 22 338 95 61

Facsimile No. +41 22 338 82 70